

Presentation Title:

Safe Yield Update

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SUSTAINABLE WATER MANAGEMENT INITIATIVE

TECHNICAL SUBCOMMITTEE

**SAFE YIELD UPDATE  
EEA SWMI  
TECHNICAL SUBCOMMITTEE**

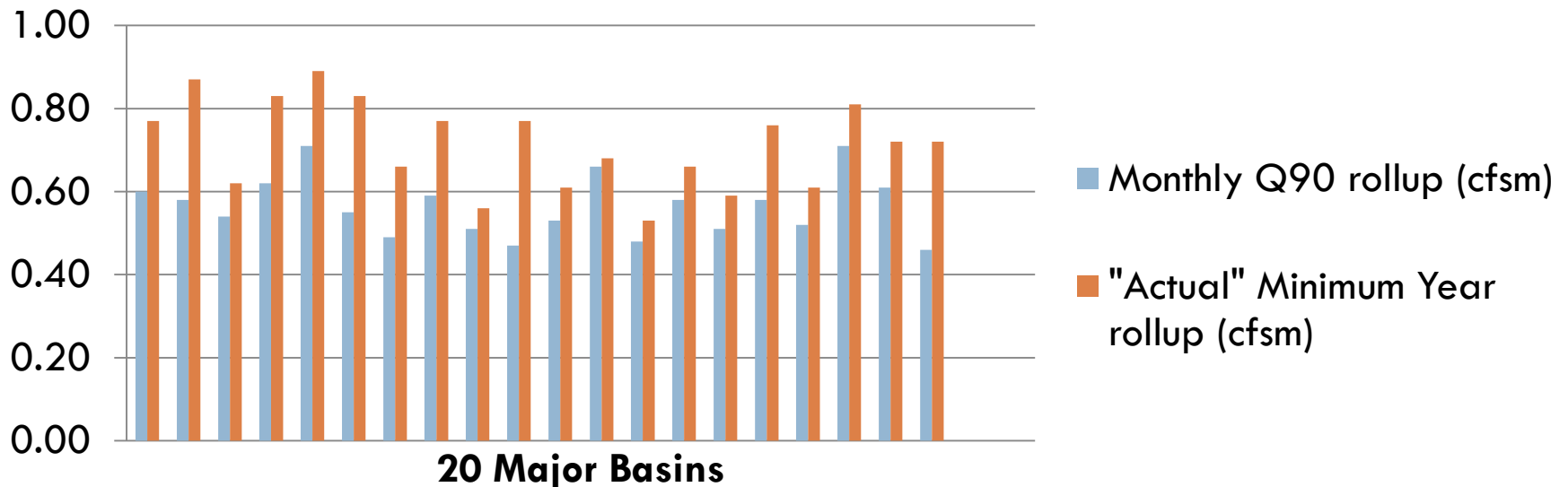
**October 12, 2010**

# Components of Safe Yield

- Basin Yield, Drought/probable driest period (BY)
- Environmental Protection Factor (EPF)
- Storage Volume (S)
- Other Considerations:
  - ▣ Time and Space
  - ▣ Alternatives where no SYE calculations
  - ▣ Consumptive Use

# Basin Yield Options

- Option 1: Monthly Q90, annualized
- Option 2: Minimum Year in period of record (recurrence range <Q75 to Q90)
- Option 3: Monthly Q80, annualized



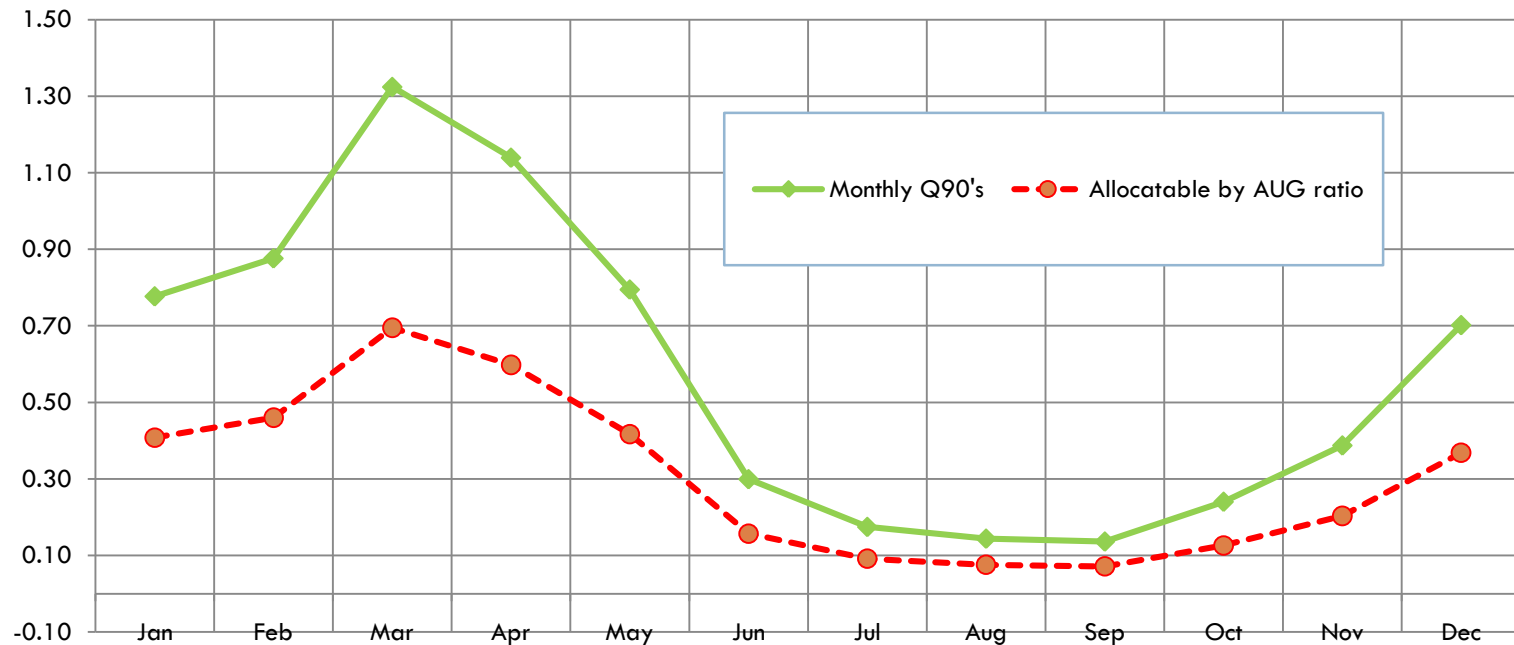
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# Environmental Protection Factor

- Use 25% of August Median Flow (AMF) as target for Safe Yield, therefore 75% August Median flow for EPF
- Translates to 30% loss of fluvial density
- Determine portion of August Basin Yield equal to fraction that represents 25% of August Median (for Ipswich and Charles, ~50%)
- Apply percentage to other months
- Consider using lower percentages in non-summer months

# Environmental Protection Factor: Example

Charles River Basin  
Basin Yield = Monthly Q90's  
Monthly Allocatable portion = 25% Aug Med / Aug Q90 = 52%



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# Environmental Protection Factor: Example

Column/ Row	A	B	C	D	E	F	G
1	Basin	August Median (cfsm)	25% of August Median* (cfsm)	August Q90 (cfsm)	% of August Q90 that equals 25% of August Median	% of August Q90 that can be taken for Safe Yield	% of August Q90 remaining for EPF
2	Basin A	0.3	0.08	0.15	50%	50%	50%
3	Basin B	0.2	0.05	0.15	33%	33%	67%
4	Basin C	0.5	0.13	0.15	83%	83%	17%
*Assumes 25% of Aug Median can be taken for Safe Yield, 75% of Aug Median reserved for EPF							

- May need a cap on percentage to avoid Basin C situation

# Storage Volume

## DRAFT Storage Volumes

(for systems that can store more than one year of basin yield and system use)

□ Chicopee	250.2
□ Nashua	141.6
□ Westfield	62.6
□ Boston Harbor	1.6
□ Housatonic	0.12
□ Quinebaug	0.07

## Consideration of Reservoir Releases

- Releases are most appropriately discussed under criteria/goals, not as part of the storage methodology



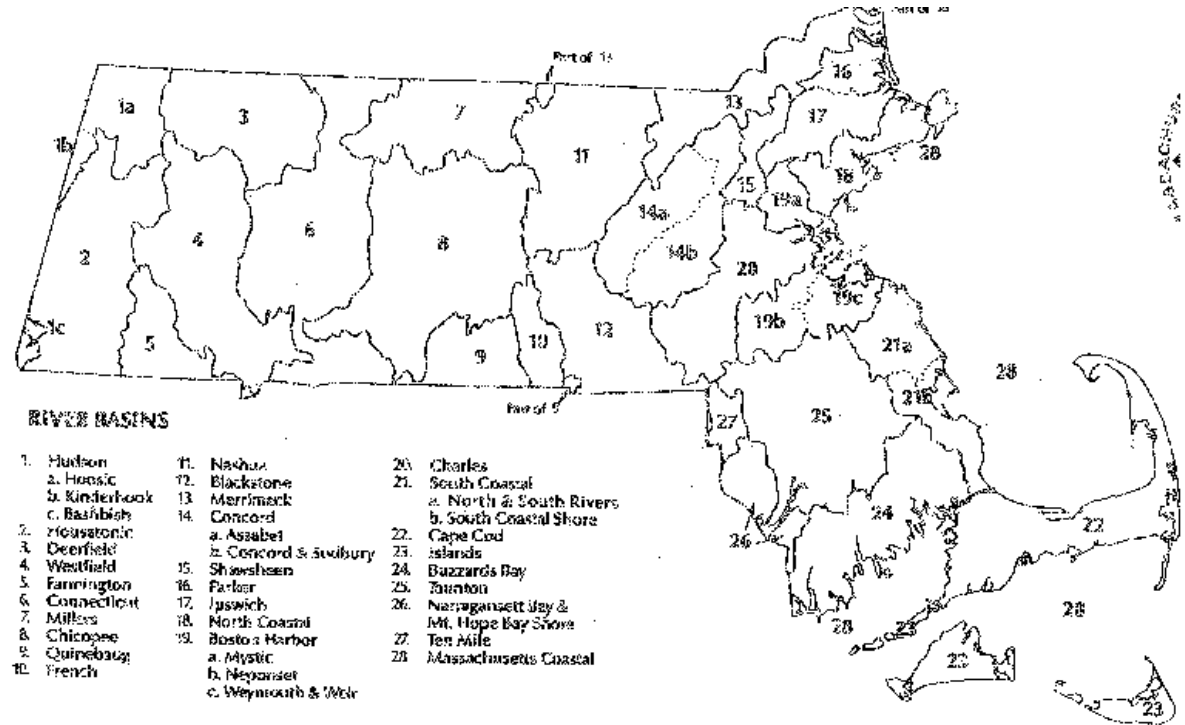
# Time and Space: Scale

Use  
“administrative”  
split where  
basins are  
geographically  
separated and  
don't flow into  
each other:

Boston Harbor

South Coastal

Hudson



# Calculating Basin Yield for non-SYE Basins

For Buzzards Bay, Cape Cod, Islands, Narragansett-Mt. Hope, North Coastal, and South Coastal

Continue to evaluate 3 options:

1. Use most similar basin and apply its basin yield (mgd/mi<sup>2</sup>)
2. Use data in SYE for Cape & Islands and Plymouth Carver Aquifer
3. Evaluate recharge numbers from DEP's October 2009 proposal

# Consumptive Use: components

- Returns that could be considered:
  - ▣ Septic Returns
  - ▣ Groundwater Discharges
  - ▣ Surface Water Discharges
- Removals that could be considered:
  - ▣ Public withdrawals
  - ▣ Private well withdrawals
  - ▣ Infiltration and Inflow

# Consumptive Use: pros and cons

## □ Pros:

- Giving credit/accounting for returns
- Giving credit for keeping water local

## □ Cons:

- Water Quality concerns
  - Data Quality concerns
  - Don't have a method for I/I estimate
- Site specific consideration during allocation may be most appropriate